



Ophthalmological Diseases

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CONSEQUENCE OF ULTRASOUND SCANNING IN CHILDREN WITH PROGRESSIVE MYOPIA

INTRODUCTION. Myopia is the most frequent pathology in children, typical for the growing process. Once simple myopia appears in a child, it almost always increases in severity. Studies have found that the rates of progression of childhood myopia range from 0 to over 1.00 dptr. per year, but that most progression is in the range of 0.3-0.5 dptr. per year. Myopia is often expressed with tension of anterior-posterior axis of eyeball. The reduction of visual functions is connected with pathological changes of eye grounds intensity in myopics. Pseudomyopia or spasm of accommodation is the initial stage for development of progressive myopia. In this stage refractive character of disease leads to stretching of anterior-posterior axis covering to the organic [1-3].

The aim of this research is to evaluate the progressive process of myopia in children especially the anterior-posterior axis (APA) and retina-chorioidea-sclera complex (RCS) through ultrasound examination A-B scanning.

METHOD USED. 25 patients at the age of 6-16 have been examined with pseudomyopia or spasm of accommodation (7) and low degree of myopia (18).

For evaluation of the progress of myopia was done double refractometry (on the background of cycloplegia) and A-B scanning for 2 years brake.

During initial examination in 7 children with spasm of accommodation APA size was 22,8-23.6 mm, thickness of RCS complex was 1,3-1,6 mm (1st group). Two years later during repeated examination in 4 children with pseudomyopia was diagnosed myopia of low degree (0,75-1,25 dptr), APA stretch size was 0,1-0,4 mm, the thickness of RCS complex 1,1-1,2 mm.

From 18 children with low degree of myopia 7 in initial examination have had myopia of 0,5-1,5 dptr, APA size was 23,7-24,1 mm, the thickness of RCS complex 1,2-1,5 mm (the lower limit of norm). At double examination was note annual growth of myopia to 0,3-0,5 dptr., the stretch size of APA was 0,11-0,33 mm. According to B-scanning there were no changes of vitreous body, and the thickness of RCS complex was 1,1-1,3 mm.

Another 11 children with low degree of myopia (3rd group) at the initial examination have had myopia of 1,75-2,75 dptr, APA size was 24,2-24,6 mm and RCS complex thickness was 1,1-1,3 mm. At double examination was note annual growth of myopia to 0,60-1,25 dptr. The stretch size of APA was 0,4-0,75 mm and RCS complex was 0,9-1,0 mm.

RESULTS AND DISCUSSION. According to research results in first group of the examined children as a result of double examination noted reduction of the RCS complex thickness in case of small size of APA stretch. More intensive progress of myopia was noted in children with low degree of myopia (3rd group) with reduction of RCS complex thickness.

Thus, determination of the RCS complex thickness as a pre-clinical symptom can be useful for evaluation of the possible growth of myopia.

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KEYWORDS:

A-B scanning,
retina-chorioidea-sclera complex,
anterior-posterior axis of eye
ball.



CONFERENCE ABSTRACTS
NOVEMBER 27th – DECEMBER 1st

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RIGIDITY OF SCLERA IN CHILDREN WITH MYOPIA

INTRODUCTION. Myopia is the most frequent visual defect which progression can lead to further irreversible changes and significant loss of vision in the eye. Progressive myopia occurs precisely in childhood.

There are three main pathogenetic elements of myopia associates with the weakening of accommodation, hereditary predisposition and weakening of sclera.

Rigidity of sclera is the measurable physical parameter of the eye that expresses elastic properties of the eyeball. In 1937 J.S. Friedenwald proposed a formula that determines the coefficient of scleral rigidity (E). According to Friedenwald the coefficient of scleral rigidity varies from 0,006 to 0,037 (average 0,0215).

METHODS USED. The research materials was 35 children and adolescents at the age from 10 to 16 years. There are 9 patients with high degree of myopia, 11 with moderate degree of myopia and 15 with mild degree of myopia.

In addition to general research (visometry, echobiometry, refractometry, ophthalmoscopy, projection perimetry) the coefficient of the scleral rigidity by Friedenwald was also calculated for all patients. The calculation was carried out by a modern hydro and hemodynamic analyzer “GlauTest-60”(Russian Federation). The procedure was performed under local anesthesia (Sol.Tetracaini1%), after which Schiötz tonometer (included in set), weighted 5.5g, was placed on the cornea for ten seconds. At the end of the measurement, the device automatically calculated the coefficient of scleral rigidity.

RESULTS AND DISCUSSION. In patients with a mild degree of myopia, the coefficient of scleral rigidity was within the norm in 13 cases and in 2 cases it was below normal values. In patients with moderate degree of myopia, the coefficient began to exceed the norm in 5 cases, and in 6 cases remained within the norm. In patients with a high degree of myopia, 6 patients had a high value of the coefficient of scleral rigidity, and in 3 patients the coefficient was approaching normal values.

Suchwise, based on the results of the study, it should be assumed that an increase in scleral rigidity in individuals with myopia can be considered as a reliable prognostic sign of the expected progression of the disease. Conversely, the restoration of the normal values of scleral rigidity (decreasing the value after the previous increase), can talk about stabilization of the process i.e. transition of progressive myopia to a stationary one.

The results obviously dictate the need to compare the scleral rigidity tests for a sufficiently long time, with a view to verify the correlations between the rate of growth of myopia and the nature of changes in scleral rigidity.

In addition, the ability to predict a progress of myopia in childhood, will allow timely and correctly organize therapeutic measures aimed at possible stabilization of myopic disease.

KEYWORDS:

myopia,
ocular rigidity,
sclera

THE INITIAL TOMOGRAPHIC SIGN OF THE PROGRESSING COURSE OF MYOPIA

INTRODUCTION. Myopia is a problem with the focusing ability of the eye. It is when the eye is not able to focus properly on objects in the distance. It happens when the lens becomes a different shape from usual, or when the eye is longer than normal, so light entering the eye focuses on a point in front of the retina, rather than right on it. People with myopia often squint while watching television or trying to see distant objects. Modern methods of myopia research are aimed at maximally visualizing changes in the posterior part of the eyeball.

Dystrophic changes on the fundus of complicated myopia can be localized both in its central areas and on the periphery. Central changes related to the optic disc and macular area. The OCT is a diagnostic method that allows cross-sectional in vivo imaging of retina, disk of optic nerve and ocular structures in the anterior segment. The OCT allows to investigate patients with high myopia, as well as the surface topography of the optic disk nerve, to measure its parameters such as diameter of the disk, retinal nerve fiber layer thickness. The purpose of this research is a tomography examination of children with progressive myopia, to identify early signs of an extension of the posterior segment of the eye.

METHODS USED. Forty children at the age of 7 to 15 years with progressive myopia of mild and moderate degree, participated in the research.

In addition to routine studies, all patients underwent permanent optical coherence tomography with the Stratus OCT device twice a year during 3-5 years.

RESULTS AND DISCUSSIONS. In a comparative analysis of OCT studies, mainly in individuals with an average degree of myopia with an annual growth gradient of more than one diopter per year, with a normal ophthalmoscope appearances of the fundus.

- 1) retinal stretching (reduction of thickness) in the macular area,
- 2) thinning of the layer of retinal nerve fibers in the nasal segment of the peripapillary zone, namely.
 - Reduction of the thickness of the retina in the macular area by approximately 120-150 mkm.
 - Thinning of the RNFL in the nasal segment was manifested by a decrease in its thickness by 20 and more percent and changes in the chromatographic image in this segment.

Taking into consideration the above mentioned facts, ophthalmoscopy revealed no changes in any of the cases of tomographically recorded deviations.

The named tomographic signs of myopic progression are considered as the earliest diagnostic indicators of the stretching of the retina-vascular complex in children with progressive myopia.



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KEYWORDS:

*progressive myopia,
tomographic sign,
macular thickness*



CONFERENCE ABSTRACTS

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EFFICIENCY OF CONDUCTION ORTOPTO-DIPLOPTIC TREATMENT CHILDREN WITH CONCOMITANT STRABISMUS DEPENDING ON AGE GROUPS

INTRODUCTION.

In the last step of the complex treatment of patients with concomitant strabismus, when we get to the high visual acuity in both eyes and direct or nearly direct injury of eye balls in orbits, first we try to get binocular vision, than to stereoscopic vision through both modern and traditional methods of ortopto-diploptic treatment. There are still not faithful results which can evaluate efficiency of treatment in different age groups.

Unfortunately rehabilitation of high qualified visual functions succeeds in not all patients with concomitant strabismus.

METHODS USED. During our research we try to find out optimal age when we can get rehabilitation of visual higher functions on the intensive treatment. For research 82 patients have been chosen with strabismus. 26 of them are 4-6 years old, 25 are 7-11 years old and 31 are 13-16 years old children.

All the children already had high visual acuity, nearly direct injury of the eyeballs in orbitas and simultaneous or non stable binocular vision.

During 18 months the patients have got ortoptic treatment course for 4 months break with 12 session. Ortoptic exercises have been applied on synoptophor device to develop positive and negative fusion reserves and to fix bifoveal connections. It was also applied convergence development exercises in children with concomitant divergent strabismus. It was applied the method of obtaining sequential images according to Cuppers.

Then diploptic exercises were done to restore bifixation mechanisms according to Avetisov A.E. and Kashenko T.P. It has been applied allocation exercises of accommodation and convergence as well as exercises by computer comparison, fusion and stereoscopic exercises.

RESULTING AND DICUSION. The results of the research have shown that it is possible more successful to get to development of fusion reserves, stable binocular and stereoscopic vision from 25 children to 19 at the age of 7-11, which makes up 76.0 % of examined children. Intellectual development level of this children allow as to overcome the tasks presented during treatment.

For this age group almost fully restored both positive and negative, vertical and inciclo-excsciclo reserves. From 26 patients at the age of 4-6 only 11 could get to the best results (42.0 %). Among 31 patients of 13-16 years old 20 can get stable binocular and stereoscopic vision (64,5 %).

The interval for restoration of high visual functions of children with concomitant strabismus is limited. It is more convenient to conduct the treatment in middle-age children (7-11 years old). In this age children can consciously overcome the tasks and still have flexible facilities to perceive the world in three-dimensional space.

KEYWORDS:

Ortoptics,
strabismus,
fusion

DISTANT OPHTHALMIC CHANGES IN CHILDREN WITH RETINOPATHY OF PREMATURITY

INTRODUCTION. Retinopathy of prematurity (ROP) is a proliferative disorder of the developing retinal blood vessels in preterm infants. The present practice point reviews new information regarding screening and management for retinopathy of prematurity, including the role of risk factors in screening, optimal scheduling for screening examinations, pain management, digital retinal photography and anti-vascular endothelial growth factor therapy.

In 2010, the AECOP with government of RA organized the screening program for every premature infant. The program policy statement differed somewhat in RA, recommending screening for infants with birth weights ≤ 2000 g and a GA of ≤ 34 weeks or less, who had an unstable clinical course and were believed to be at high risk for ROP.

Infants who have had ROP are at risk of poor visual acuity and other visual disturbances, regardless of whether treatment was required. These infants require long-term ophthalmological follow-up.

METHODS USED. There are 74 infants examined in University Ophthalmology Clinic, which were diagnosed hard clinical course of ROP. 24 of them were done peripheral ablation of retina, 17 of them were done anti-VEGF treatment. In the other cases the ROP went on spontaneous regression. All the patients are under the permanent observation of doctor and periodically are examined with ocular routine methods.

RESULTS AND DISCUSSIONS. In examined children were found different ocular lesions. In 36% of examined were detected high degree of myopia, in 41% strabismus. 19% of examined were children with amblyopia (here also are presented cases with disbinocular amblyopia) and nearly 4% with ROP changes of recovery period.

It should be noted that 68% children with peripheral ablation of retina were found divergent strabismus, frequently (in 54% of them) with disorders of refraction. In 26% of patients were found low, middle or high degree of myopia. While children which have been treated anti-VEGF continue to follow-up because of high degree of myopia and only in 12% have been diagnosed strabismus. Only in 19% of the children included in our risk group were diagnosed amblyopia. It is distinctive that the restoration of vision functions of the children with amblyopia is proceeding very slowly and only 4% increase visual acuity. The control of this children with ROP recovery period went according to visual functions condition, have got conservative and physiotherapy treatment.

According to the results of the research we can conclude that the retinal pathological processes are caused different ocular long-term changes the treatment of which is carried out by pediatric ophthalmologists. This fact highlighted the children's dynamic and periodic observation (up to the end of the visual system formation) in purpose to find out different anatomical and functional changes.

Considering with the low efficiency of treatment children with amblyopia it is very important to include to the process of the treatment other narrow specialists (neurologist, pediatrician) or involvement of additional examination.



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KEYWORDS:

premature infant;
ROP;
Anti-VEGF therapy



CONFERENCE ABSTRACTS

NOVEMBER 27th – DECEMBER 1st

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OUR EXPERIENCE IN TREATMENT OF VERTICAL STRABISMUS

INTRODUCTION Vertical strabismus is caused by congenital paresis of vertical action muscles. Most often it is only the superior oblique muscle of only one of eyes is affected, less often - superior rectus, and the least often - inferior rectus. In such a case either concomitant vertical strabismus or dissociated vertical strabismus is observed. In other words, eyes deviate upward alternately, or one of them deviates upward and the other - downward. At the same time, there is paresis of superior oblique muscle of the former, which is compensated by hyper function of inferior oblique muscle. In regard to the other eye, there is hyper function of inferior rectus muscle, and superior rectus muscle is weakening. Alternatively, there can be paresis of superior rectus muscle of the eye that deviates downward, which is still compensated by hyper function of inferior rectus muscle and inferior oblique muscle of the other eye.

It is well-known that even if it is small-angle deviation, vertical strabismus is not treated by conservative methods. It is possible to treat strabismus effectively and create favorable conditions for further development of binocular vision only surgically. There are different approaches to surgical treatment of vertical strabismus.

The goal of the thesis is to summarize experience in surgical treatment of vertical strabismus and recommendations on tactics of surgical treatment of a given type of strabismus.

METHODS USED. Analysis of surgical treatment of 43 children at the age of 5-11 has been done. In the primary position of gaze all the children were diagnosed with vertical deviation. Deviation angle of 32 patients was equal to 8° -10°, and that of 11 children was 15°.

Symptoms of hypertrophied were getting stronger in adduction and when their heads were tilted to the opposite side. Forced head position was observed among 12 of the patients.

The 22 patients underwent myectomy of inferior oblique muscle, the 12 children underwent recession and the rest 9 underwent anterior transposition of the muscle.

RESULTS AND DISCUSSIONS. In the post-operative period correct gaze position was observed among all the 22 patients that had undergone myectomy of inferior oblique muscle; forced head position was not observed among all the 6 children (out of the 22) who had had it before. No deviation was observed among 8 out of the 12 children that experienced recession of inferior oblique muscle, deviation angle of the rest 4 decreased, and all the children still had forced head position. Finally, position of eye was corrected among all the 9 patients who had undergone anterior transposition of the inferior oblique muscle; no forced head position was observed among all the 4 children (out of the 9) who had been suffering from it.

Our Experience in surgical Treatment of Vertical Strabismus shows that myectomy of inferior oblique muscle is preferable to recession and anterior transposition.

KEYWORDS:

surgical
treatment,
vertical strabismus

REFRACTOGENESIS OF ASTIGMATIC EYE CHILDREN IN THE PROCESS OF PLEOPTIC TRAETMENT OF REFRACTIVE AMBLYOPIA

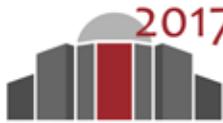
INTRODUCTION. Monoilateral astigmatism is the frequent reason of the refractive amblyopi. It was noted earlier the lability of astigmatic refraction of children. The aim of the research set by monitoring of refraction of persons with unilateral amblyopia which gave out the changes in indexes of astigmatism in the course of long-term pleoptic treatment.

METHODS USED. As a material of research 500 children at the age of 5-10 with verified unilateral astigmatism diagnosis were served. Accordingly they were with refraction amblyopia of different degrees. To all patients with the aim of pleoptic treatment were used correction with glasses, straight occlusion, light stimulation of the retina, local stimulation with variable magnetic field, transpalpebral ionophoresis with preparations Riboflavin, Taurine and etc.

It should be noted, that in all cases astigmatic component of the proscribed glasses fixed on 1/3-1/2 less date of statistical refraction. The results of the treatment were evaluated by the changes of corrected visual acuity of amblyopic eye. On the same eyes skiascopically and autorefractometrically the dynamic refraction have been examined before and after the course of therapy. It was implemented 2-3 course of treatment. Each of them included 12 session in a year. The treatment was conducted before the patient's performance of 15 years old. The terms of observation were 5-10 years.

RESULTS AND DISCUSSIONS. The number of children with 4th, 3rd, 2nd degrees of amblyopia on the worst eyes before and after treatment were: 50 children (10.0 %) before the treatment and absence of them after the therapy (0.0 %), 175 (35.0 %) and 50 (10.0 %) children, 199 (40.0 %) and 84 (17.0 %) children, 76 (15.0 %) and 175 (35.0 %) children. Accordingly at the end of the treatment amblyopia was not determined in 191 (38.0 %) of cases. It is identified significant correlation not only between the depth of amblyopia and rate of the initial ametropia, which is quite expected, but also between the depth of amblyopia and initial force of astigmatism on the worst eye as well. Furthermore during the observation almost half of the cases (223 children or 44.6 %) were noted the tendency to spherization of the dynamic refraction on the amblyopic eye. This was generated in decreasing the force of astigmatism in 1.0 – 3.0 dptr.

“Side effect” of treatment for the significant part of the patients was noted the tendency to the spherization of aspheric eye. It is obvious, that the flexibility of the accommodation system in childhood will allow us in certain degree simulate of the necessary refraction during several years in the case of children with hyperopia.

2017

Science week
CONFERENCE ABSTRACTS
NOVEMBER 27th – DECEMBER 1st

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KEYWORDS:

amblyopia,
astigmatism,
refractogenesis.



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